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(पहला पुनरीक्षण)

Indian Standard

ELECTROTECHNICAL VOCABULARY

PART 60 ELECTRICAL APPARATUS FOR EXPLOSIVE ATMOSPHERES

(First Revision)

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Basic Electrotechnical Standards Sectional Committee, ET 01

NATIONAL FOREWORD

This Indian Standard (Part 60) (First Revision) which is identical with IEC Pub 50 (426) (1990) 'International electrotechnical vocabulary — Chapter 426 : Electrical apparatus for explosive atmospheres', issued by the International Electrotechnical Commission (IEC), was adopted by the Bureau of Indian Standards on the recommendation of the Basic Electrotechnical Standards Sectional Committee, and approval of the Electrotechnical Division Council.

This Indian Standard (Part 60) was first published in 1984. This first revision has been undertaken to align it with the international practice.

Only the English text given in the IEC publication has been retained while adopting as Indian Standard, and as such the page numbers given here are not the same as in IEC Publication.

Indian Standard
ELECTROTECHNICAL VOCABULARY
PART 60 ELECTRICAL APPARATUS FOR EXPLOSIVE ATMOSPHERES
(*First Revision*)

SECTION 426-01 — GENERAL TERMS

426-01-01

electrical apparatus for explosive atmospheres
explosion-protected electrical apparatus
hazardous location equipment

Electrical apparatus constructed in such a way as not to produce an ignition of the surrounding explosive atmosphere, under specified conditions.

Note.— IEC Publication 79 standardizes this apparatus for explosive gas atmospheres.

426-01-02

type of protection (of an electrical apparatus for explosive atmospheres)

The specific measures applied to electrical apparatus to avoid ignition of a surrounding explosive atmosphere by such apparatus.

426-01-03

group (of an electrical apparatus for explosive atmospheres)

A classification of electrical apparatus related to the explosive atmosphere for which it is to be used.

Note. — IEC Publication 79 defines two groups:
Group I, electrical apparatus for mines susceptibles to fire damp;
Group II, which can be divided into sub-groups, electrical apparatus for all places with an explosive gas atmosphere other than mines susceptible to fire damp.

426-01-04

maximum surface temperature

The highest temperature attained in service under the most adverse operating conditions within the rating of the electrical apparatus by any part or any surface of the apparatus which could produce an ignition of the surrounding explosive atmosphere.

Note. — The most adverse operating conditions include recognized overloads and any fault condition recognized in the specific standard for the type of protection concerned.

426-01-05

temperature class (of electrical apparatus for explosive atmospheres)

A classification of electrical apparatus for explosive atmospheres based on its maximum surface temperature.

SECTION 426-02 — PHYSICAL AND CHEMICAL PHENOMENA

426-02-01

ignition temperature of an explosive gas atmosphere

The lowest temperature of a heated surface at which, under specified conditions, the ignition of a flammable substance in the form of a gas or vapour mixture with air will occur.

Note. — IEC Publication 79-4 standardizes a method for the determination of this temperature.

426-02-02

explosive atmosphere

A mixture with air, under atmospheric conditions, of flammable substances in the form of gas, vapour, mist, dust or fibres in which, after ignition, combustion spreads throughout the unconsumed mixture.

426-02-03

explosive gas atmosphere

A mixture with air, under atmospheric conditions, of flammable substances in the form of gas, vapour or mist, in which, after ignition, combustion spreads throughout the unconsumed mixture.

426-02-04

explosive dust atmosphere

A mixtuie with air, under atmospheric conditions, of flammable substances in the form of dust or fibres in which, after ignition, combustion spreads throughout the unconsumed mixture.

426-02-05

explosive test mixture

A specified explosive mixture used for the testing of electrical apparatus for explosive gas atmospheres.

426-02-06

most easily ignitable mixture

A mixture which, under specified conditons, requires the lowest electrical energy for its ignition.

426-02-07

most explosive mixture

A mixture which, under specified conditions, gives the highest explosion pressure after ignition.

426-02-08

most incendive mixture

A mixture the flame of which, under specified conditions, most easily transmits an ignition through a joint.

426-02-09

lower explosive limit

LEL (abbreviation)

The concentration of flammable gas, vapour or mist in air below which an explosive gas atmosphere will not be formed.

426-02-10

upper explosive limit

UEL (abbreviation)

The concentration of flammable gas, vapour or mist in air above which an explosive gas atmosphere will not be formed.

426-02-11

maximum experimental safe gap

MESG (abbreviation)

The maximum gap of the joint between the two parts of the interior chamber of a test apparatus which, when the internal gas mixture is ignited and under specified conditions, prevents ignition of the external gas mixture by flame propagation through a 25 mm long joint, for all concentrations of the tested gas or vapour in air.

Note. — IEC Publication 79-1 A standardizes an apparatus and a test method.

426-02-12

minimum igniting current

MIC (abbreviation)

The minimum current which, in a specified spark test apparatus and under specified conditons, is capable of igniting the most easily ignitable mixture.

Note.— IEC Publication 79-3 standardizes a spark test apparatus.

426-02-13

explosion (of an explosive atmosphere)

A sudden increase of pressure and temperature, due to oxidation or other exothermic reaction.

426-02-14

flash point

The lowest liquid temperature at which, under certain standardized conditions, a liquid gives off vapours in quantity such as to be capable of forming an ignitable vapour/air mixture.

426-02-15

pressure piling

A phenomenon resulting from ignition, in one compartment or subdivision of an enclosure, of a gas mixture pre-compressed by a previous ignition in another compartment or sub-division.

SECTION 426-03 — AREAS AND ZONES

426-03-01

hazardous area (on account of explosive gas atmospheres)

An area in which an explosive gas atmosphere is or may be expected to be present in quantities such as to require special precautions for the construction, installation and use of electrical apparatus.

Note. — IEC Publication 79-10 gives a classification of hazardous areas (see 426-03-03, 426-03-04 and 426-03-05).

426-03-02

non-hazardous area (on account of explosive gas atmospheres)

An area in which an explosive gas atmosphere is not expected to be present in quantities such as to require special precautions for the construction, installation and use of electrical apparatus.

426-03-03

zone 0 (in the classification of hazardous areas)

An area in which an explosive gas atmosphere is present continuously, or is present for long periods.

426-03-04

zone 1 (in the classification of hazardous areas)

An area in which an explosive gas atmosphere is likely to occur in normal operation.

426-03-05

zone 2 (in the classification of hazardous areas)

An area in which an explosive gas atmosphere is not likely to occur in normal operation and if it does occur it will exist for a short period only.

426-03-06

source of release

A point or location from which a gas, vapour, mist or liquid may be released into the atmosphere so that an explosive gas atmosphere could be formed.

Note.— IEC Publication 79-10 gives a classification of sources of release.

426-03-07

natural ventilation

The movement of air and its replacement with fresh air due to the effects of wind and /or temperature gradients.

426-03-08

general artificial ventilation

The movement of air and its replacement with fresh air by artificial means, for example fans, and applied to a general area.

426-03-09

local artificial ventilation

The movement of air and its replacement with fresh air by artificial means applied to a particular source of release or local area.

SECTION 426-04 — CONSTRUCTION OF ELECTRICAL APPARATUS

426-04-01

enclosure (of electrical apparatus)

All the walls which surround the live parts of electrical apparatus including doors, covers, cable entries, rods, spindles and shafts.

426-04-02

degree of protection provided by enclosures (of electrical apparatus)

The measures applied to the enclosures of electrical apparatus to provide for:

1) the protection of persons against contact with or approach to live parts and against contact with moving parts (other than smooth rotating shafts and the like) inside the enclosure and the protection of the apparatus against ingress of solid foreign bodies;

2) the protection of the apparatus inside the enclosure against harmful ingress of water.

426-04-03

breather (of an electrical apparatus for explosive atmospheres)

A device which permits an exchange between the atmosphere within an enclosure and the surrounding atmosphere and which maintains the integrity of the type of protection.

426-04-04

drain
draining device

A device which permits liquids to flow out from an enclosure and which maintains the integrity of the type of protection.

426-04-05

special fastener (of an electrical apparatus for explosive atmospheres)

A fastening device designed to deter unauthorized personnel from invalidating the type of protection of an electrical apparatus for explosive atmospheres.

426-04-06

protective shroud

A part surrounding the head of a bolt or screw or nut in a specified manner in order to produce a special fastener.

426-04-07

direct entry (into electrical apparatus)

A method of connection of an electrical apparatus to the external circuits by means of the connecting facilities inside the main enclosure or in a terminal compartment having a free opening to the main enclosure.

426-04-08

indirect entry (into electrical apparatus)

A method of connection of an electrical apparatus to the external circuits by means of a terminal box or a plug and socket connection which is external to the main enclosure.

SECTION 426-05 — TESTS OF ELECTRICAL APPARATUS

426-05-01

type test

A test of one or more devices made to a certain design to show that the design meets certain specifications (151-04-15).

426-05-02

routine test

A test to which each individual device is subjected during or after manufacture to ascertain whether it complies with certain criteria (151-04-16).

SECTION 426-06 — FLAMEPROOF ENCLOSURES OF ELECTRICAL APPARATUS

426-06-01

flameproof enclosure "d" (of electrical apparatus for explosive gas atmospheres)

explosion proof enclosure

A type of protection of electrical apparatus in which the enclosure will withstand an internal explosion of a flammable mixture which has penetrated into the interior without suffering damage and without causing ignition, through any joints or structural openings in the enclosure, of an external explosive atmosphere consisting of one or more of the gases or vapours for which it is designed.

Note.— This type of protection is indicated by the letter "d".

426-06-02

flameproof joint

The place where corresponding surfaces of the different parts of a flameproof enclosure come together and prevent the transmission of an internal explosion to the explosive gas atmosphere surrounding the enclosure.

426-06-03

gap (of a flameproof joint)

The distance between the corresponding surfaces of a flameproof joint. For cylindrical surfaces, the gap is the diametral clearance (difference between the two diameters).

426-06-04

maximum permitted gap

The highest value of gap, defined according to the electrical apparatus group, the volume of the flameproof enclosure and the length of the flameproof joint.

426-06-05

length of flameproof joint

length of flame path

width of flameproof joint

The shortest path through a flameproof joint from the inside to the outside of a flameproof enclosure.

Note. —This definition does not apply to threaded joints.

426-06-06

flameproof bushing

An insulating device carrying one or more conductors through internal or external walls of a flameproof enclosure without affecting the flameproof properties of the enclosure or its compartments.

SECTION 426-07 — SAND FILLED ELECTRICAL APPARATUS

426-07-01

sand filling "q" (of electrical apparatus for explosive gas atmospheres)

A type of protection of electrical apparatus in which the enclosure is filled with sand or other powder material of specified characteristics so that, in the intended conditions of service, any arc or high temperature occurring within the enclosure will not ignite the surrounding explosive gas atmosphere.

Note.— This type of protection is indicated by the letter "q".

SECTION 426-08 — INCREASED SAFETY ELECTRICAL APPARATUS

426-08-01

increased safety "e" (for electrical apparatus for explosive gas atmospheres)

A type of protection in which additional measures are applied so as to give increased security against the possibility of excessive temperatures and of the occurrence of arcs and sparks inside and on external parts of electrical apparatus which does not produce arcs or sparks in normal service.

Notes

1 — This type of protection is indicated by the letter "e".

2 — Increased security in electrical apparatus which does not produce electric arcs or sparks in normal service is achieved only by the application of the specific additional measures prescribed in IEC Publication 79-7.

426-08-02

limiting temperature (of increased safety electrical apparatus)

The maximum permissible temperature of apparatus or parts of apparatus equal to the lower of the two temperatures determined by:

a) the danger of ignition of the explosive gas atmosphere;

b) the thermal stability of the materials used.

426-08-03

time t_E (for increased safety electrical apparatus)

The time taken for a.c. windings, when carrying the starting current I_A, to be heated up from the temperature reached in rated service and at miximum ambient temperature, to the limiting temperature.

SECTION 426-09 — PRESSURIZED ELECTRICAL APPARATUS

426-09-01

pressurization "p" (of electrical apparatus for explosive gas atmospheres)

A type of protection of electrical apparatus in which safety is achieved by means of a protective gas maintained at a pressure above that of the surrounding atmosphere.

Note. — This type of protection is indicated by the letter "p".

426-09-02

pressurized enclosure

An enclosure into which entry of the external atmosphere is prevented by pressurization.

426-09-03

purging

The passing of sufficient volume of protective gas through a pressurized enclosure and its ducts before the application of voltage to the apparatus to reduce any explosive gas atmosphere to a concentration well below the lower explosive limit.

426-09-04

protective gas

A gas used to maintain pressurization or to dilute flammable gas or vapour to a concentration well below the lower explosive limit.

Note. — The protective gas may be air, nitrogen or any other non-flammable gas or a mixture of such gases.

SECTION 426-10 — OIL IMMERSED ELECTRICAL APPARATUS

426-10-01

oil immersion "o" (for electrical apparatus for explosive gas atmospheres)

A type of protection of electrical apparatus in which all the apparatus or parts of the apparatus are immersed in oil in such a way that an explosive gas atmosphere, which may be above the oil or outside the enclosure, will not be ignited by the apparatus.

Note. — This type of protection is indicated by the letter "o".

SECTION 426-11 — INTRINSICALLY-SAFE AND ASSOCIATED ELECTRICAL APPARATUS

426-11-01

intrinsically-safe circuit

A circuit in which any spark or thermal effect produced either normally or in specified fault conditions is incapable, in the specified test conditions, of causing ignition of a given gas or vapour.

Note.— IEC Publication 79-11 specifies the test conditions for these circuits.

426-11-02

intrinsically-safe electrical apparatus

An electrical apparatus in which all the circuits are intrinsically safe.

426-11-03

associated electrical apparatus (connected to intrinsically-safe circuits)

An electrical apparatus in which the circuits or parts of circuits are not all necessarily intrinsically safe but which contains circuits that can affect the safety of the intrinsically-safe circuits associated with it.

426-11-04

apparatus of category "ia"

An intrinsically-safe electrical apparatus which is incapable of causing ignition in normal operation, and with a single fault and with any combination of two faults applied.

426-11-05

apparatus of category "ib"

An intrinsically-safe electrical apparatus which is incapable of causing ignition in normal operation and with any single fault applied.

426-11-06

safety barrier

A device for use between intrinsically-safe and non-intrinsically-safe circuits for the purpose of limiting the voltage and current in the intrinsically-safe circuits to levels incapable of causing ignition.

426-11-07

spark test apparatus (for intrinsically-safe circuits)

An apparatus used to verify experimentally that the electrical sparks of a circuit are incapable of igniting a specified explosive gas atmosphere.

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BUREAU OF INDIAN STANDARDS

Headquarters:

Manak Bhavan, 9 Bahadur Shah Zafar Marg, New Delhi 110002
Telephones : 331 01 31, 331 13 75

Telegrams : Manaksanstha
(Common to all offices)

Regional Offices :	Telephone
Central : Manak Bhavan, 9 Bahadur Shah Zafar Marg NEW DELHI 110002	331 01 31 331 13 75
Eastern : 1/14 C. I. T. Scheme VII M, V. I. P. Road, Maniktola CALCUTTA 700054	37 84 99, 37 85 61 37 86 26, 37 86 62
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